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SNAKES
AN INTRODUCTION

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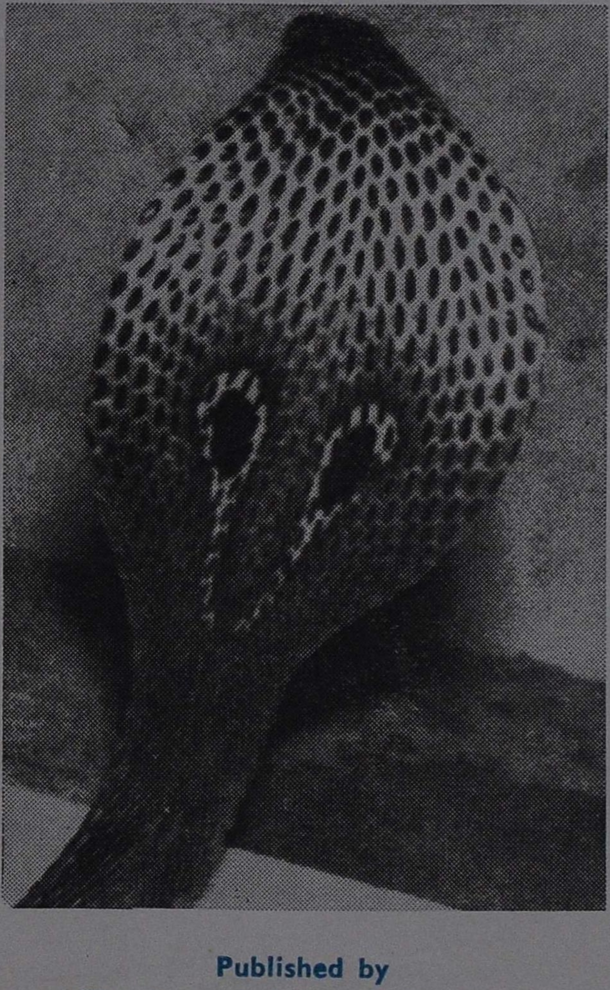

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FOREWORD

It is a good thing that the curator J. R. Asokan has brought out a book-let on Snakes. Conservation is the major concern of the present day World. Conservation of fauna is being implemented at all levels. But before Conservation we ought to know about the animals at basic level. In this aspect this book-let helps us to have a clear understanding of Snakes. In a brief but lucid way the author has done his job effectively.

There is also a checklist of Snakes of the Government Museum, Madras which will be useful to the students and research scholars as a ready reference.

I wish him all the best and wish many more creations of this kind in future also..

K. DHEENADHAYALAN, I.A.S.,

4.6.96 Commissioner of Museums

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INTRODUCTION :

Snakes are quite interesting creatures. Many people are afraid of snakes. Generally people think that all snakes are poisonous. That is why they kill them wherever they see them. But in actual fact snakes are very gentle creatures. Only very limited numbers are poisonous. They also do not attack or bite unless provoked.

Snakes are found all around us. Even though we do not see them, there is a chance that snakes would be there in many places in natural environment. Snakes are being killed unnecessarily. In fact we must protect them, because they play a major role in the control of rodents, especially rats. The rats destroy 25 to 50 % of our food grains. The rat - snake which especially feeds on rats can kill hundreds of rats in one year.

What are Snakes ? Snakes are reptiles. The Animal Kingdom is divided into two groups. One is called ' Invertebrate' and the other grooup is called ' Vertebrate '. The Vertebrates have back bone. The invertebrates do not have them. The vetebrates are further sub divided in to many classes like mammals, birds, fishes and reptiles. Hence snakes are reptiles with back bones.

In the class Reptilia (Reptiles) itself there are lots of varieties of animals. They are turtles, tortoises, crocodiles, lizards, monitors, skinks etc, All are related to snakes.

Snakes are generally classified as poisonous and non - poisonous. A snake is called a poisonous one when it possesses venom gland, venom duct, poison fangs and when its bite is fatal to human beings. But the apparent death by snake bite may be due to other factors also. All the other snakes, which do not possess venom, or do possess very little venom are called non - poisonous snakes. A bite by this snake does not cause any serious effect except some burning sensation and little pain. Sometimes due to fear a bite by a non - poisonous snake may cause death.

There are 2700 species (varieties) of snakes on earth of which nearly 270 are considered to be poisonous. In India alone there are 244 species of which 52 are considered to be poisonous. But out of this 52, we used to encounter commonly only 4 species of poisonous snakes.

Snakes are found in all types of environments. They live in the plains, mountains, valleys, deserts, fresh waters and in oceans. Snakes are of different sizes and colours. Some grow to the size of only 7 inches, like 'worm snakes' and some grow to the length of more than 30 feet like the Anaconda of South America or the Reticulated python of South East Asia.

GENERAL FEATURES OF SNAKES :

Body Structure :-

Snakes have elongated tube like body. They do not have forelimbs and hind limbs. But their relatives, 'lizards' have them. Snakes have evolved on this planet some 135 million years ago from the ancient lizards, i.e., 100 million years before the coming of 'man'. Their ancestors might have had forelimbs and hind limbs which they might have lost due to various reasons. Even though this type of body structure looks disadvantageous, it has its own advantages. For catching their prey and for their movement in crevices, this type of body is best suited.

Locomotion:-

Snakes have no limbs. Snakes move by their undulating movement of their body. The vertebral column possess innumerable ribs, throughout its length, like the feet of a millipede. These ribs move in a wave pattern forward to backward thus causing the movement of the animal. These ribs are attached to the ventral scales internally. Hence their movement automatically causes the movement of the scales. Most snakes can climb, and almost all can swim. Many tree snakes are specially adapted for climbing and have notched belly scales for this purpose.

Eye sight :-

Snakes are considered not keen with their eye sight. If we stood motionless many tree snakes will utilize us for their climbing. There is an opinion that slender snakes have better eye sight than bulky, snakes. Snakes do not have eyelids also. The eyelids fused over the eye, form part of the vision apparatus.

Hearing :-

Snakes do not have tymphanic membrane and external ears. Hence hearing through air born sound is not possible. Recently, by scientific experiments, it has been proved that snakes can hear air born sounds of low frequencies, that is 100 to 700 Htz. Sense of hearing in snakes is through vibrations. The vibrations of the ground is felt by the lower jaw and conveyed to the internal ear.

Smell :-

Most snakes find the sense of smell as the most important among the sense faculties. Snakes depend mostly on the tongue to pick up scent particles from the air and the ground. That is why a snake is constantly flicking its forked tongue out.

Food and Feeding :-

Food and feeding vary among different species of snakes. Generallly they feed on insects, frogs, lizards and rodents. Sea snakes feed on fishes. Pythons feed on smaller birds and mammals. There are cannibalistic snakes like kraits and king cobras which feed on other snakes.

Poison apparatus of the poisonous snakes is much helpful in their feeding habits. Harmless snakes catch their prey and swallow it alive. Bigger snakes like sand boa and python catch and squeeze their prey and they can swallow bigger animals

than their own size.

A snake stores up fat in its body and some snakes can exist for many months without eating. Usuallly, snakes feed once every few days.

Breeding :-

Snakes reproduce by sexual reproduction. Most snakes mate once a year and each species has its own mating season. Toward south India , more species seem to have two mating seasons. Mates are located by scent. Both sexes have musk glands in the base of the tail at the anal opening.

Some snakes lay eggs, others give birth to young ones . Fresh water snakes, cobras, pythons, and rat snakes lay eggs. Green snakes,vipers, sea snakes, sand boas and some other bear living ones. The female usually lay her eggs in suitable shelter and desert them. Cobras, King cobras, Kraits, Pythons, Checkered Keel back stay with the eggs for atleast part of the incubation period. The king cobra is the only snake which constructs a small nest with dead leaves for egg laying. Young ones after hatching have to fend for themselves.

Moulting :-

Snakes grow fastest in the first two years of their lives. As children always grow out of clothes and shoes, so snakes need new skins once in a while. The outer thin layer of their skin becomes too tight so they grow a new one and crawl out of the old. Just before shedding its skin, a snake becomes dull and lazy. After it has shed it, it looks bright and alert. This renewal made the anciednt Greeks believe that snakes live for ever. Snake moult many times, in a year.

SNAKES OF INDIA :

As it has been mentioned earlier there are 244 species of snakes in India of which 52 are poisonous. The important **pioisonous snakes** of India can be grouped into 5 categories.

They are :

1. Cobras 2. Kraits 3. Vipers 4. Coral snakes and 5. Sea snakes.

Cobras :-

Cobras are called in Tamil ' Nalla Pambu ' or ' Naga Pambu'. They can be easily identified by the presence of hood. When frightened cobras raise themselves and spread out their long rib bones to form their famous hood. This is called 'defence display'. By spreading the hood they warn the enemy that they are dangerous animals.

Nearly 10 species of cobras are distributed in Africa and in South Asia. There are three kinds of cobras which are found in the Indian sub continent. They are 1) **Spectacled cobra**, in which we can see an ' U ' shaped marking on the dorsal side of the hood. 2) **Monocled cobra** which has a ring like marking on the dorsal side of the hood and the third variety is without any marking. Sometimes it is called **black cobra.** The spectacled cobra is found throughout India but the other two varieties are found in Northern India. The King cobra is not a true cobra. It is only related to the cobras though it stands up and spreads its hood. King cobras are found in South EastAsia. They are the longest venomous snakes in the world. They grow upto 18 feet in length, while the ordinary cobras grow up to 4 to 6 feet. King cobras can be easily identified by the light cross bands mainly on the forebody. King Cobras eat other snakes. They are called in Tamiil ' Raja Nagam'. King cobras are mainly found in dense forest areas.

Cobras are most active at dusk, hunting along the edges of paddy fields for rats and mice. They lay 10 to 30 eggs between June and August and they generally incubate the eggs for 2 months till they hatch. The young ones are more deadly than the adults.

There is another interesting variety of cobra which is

found in Africa called 'Spitting Cobra'. They eject the venom into the victim's eyes (within 6 feet). Unless the eyes are washed in water immediaitely, total blindness will ensue.

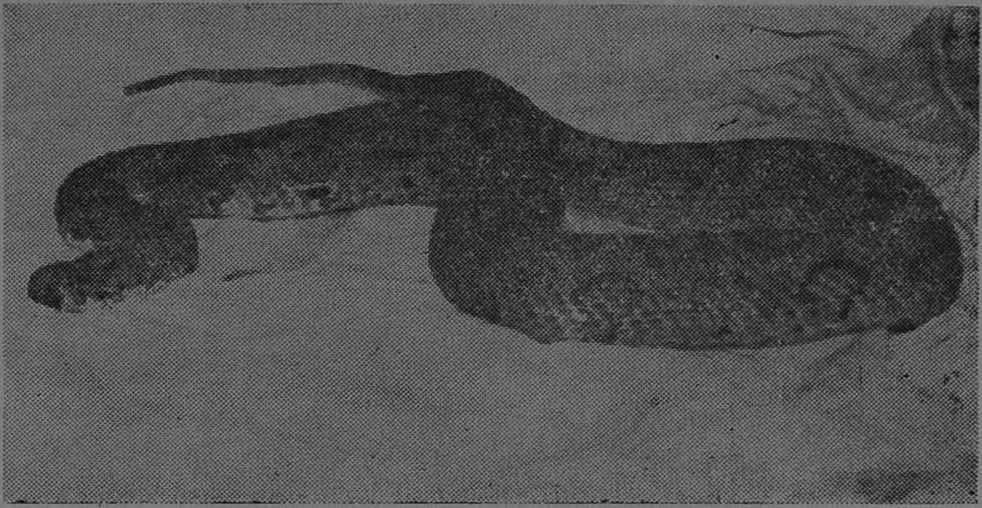
Kraits :-

In Tamil, the snakes of this group are called 'Kattu viriyan'. Generally we encounter only two types of kraits in India. They are 1) the Common krait and 2) the Banded Krait.

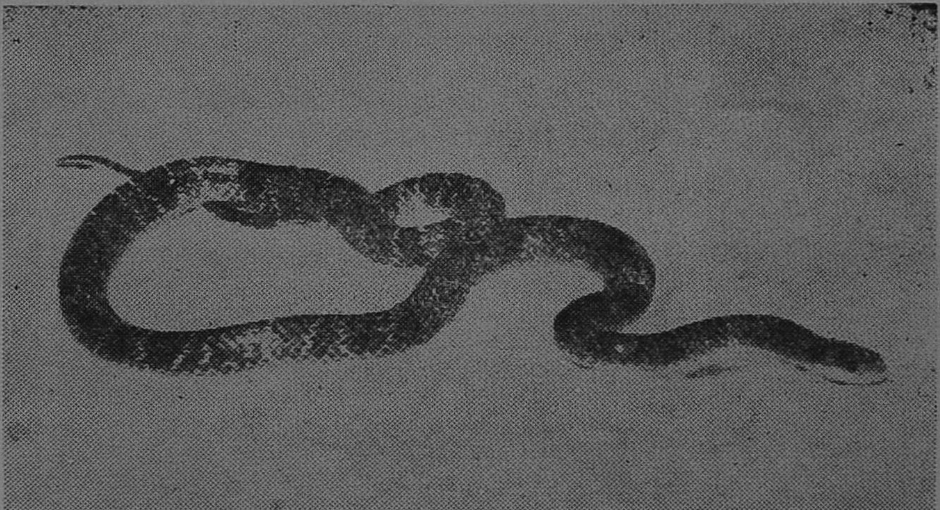
The **Common krait** can be easily identified by the bluish black body and white cross bands over that. Generally the white bands are 40 in number. These look very polished or oily. That is why they are some times called in Tamil 'Ennai viriyan'. These grow upto 6 feet. They are most dangerous than cobras. They are commonly found around house holds and their venom is 10 times more powerful than cobras. Kraits are distributed throughout India. They lay 10 to 15 eggs and they are cannibalistic . Another krait veriety of common Indian occurance is the **Banded Krait.** They can be easily identified by the presence of Black and yellow bands all over the body. Even though they are posionous they are sluggish animals and they rarely bite. They are distributed only in North India.

Vipers :-

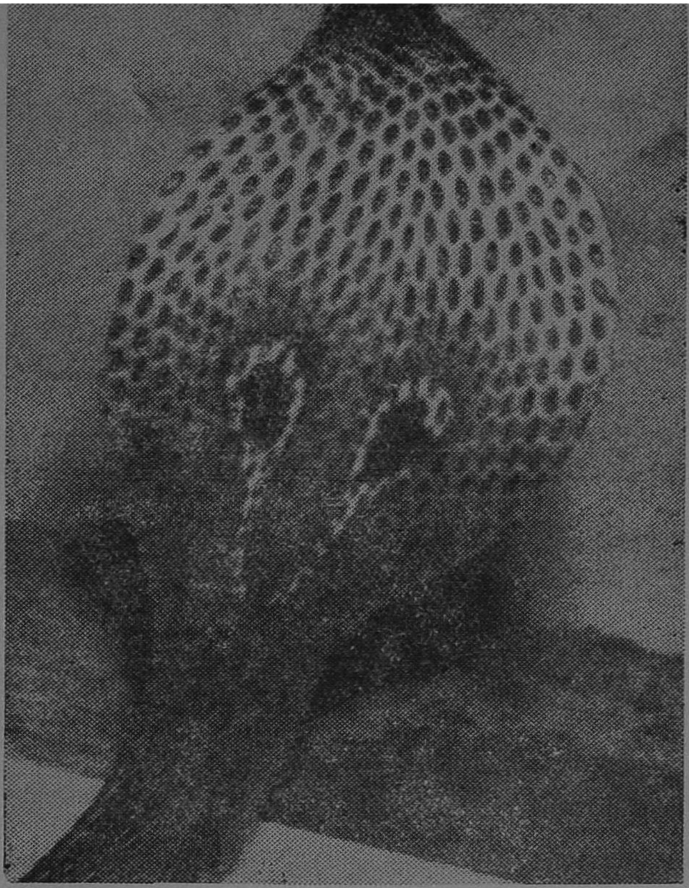
The term vipers cover a big group and generally they are classified into two sub groups viz., 1) Pit vipers and 2) Pitless vipers. Pit vipers can be identified by the presence of a loreal pit between the eye and the nostril. Heat sensitive organs are present inside the pit and they are helpful in catching the warm blooded animals. Nearly 22 viper species are present in India, out of which 15 are Pit vipers. But they are generally found in the forest areas. Among the most common are the Malabar and Hump-nosed pit vipers. To the Pitless viper group belongs 1) Russell's viper and 2) Saw scaled viper. The **Russell's viper** is a fat bulky snake but it can move with surprising speed when it is in danger. If attacked it may jump liike a spring and attack with all its might. It can easily be identified by the presence of chain like



கண்ணாடி விரியன்
Russell's viper

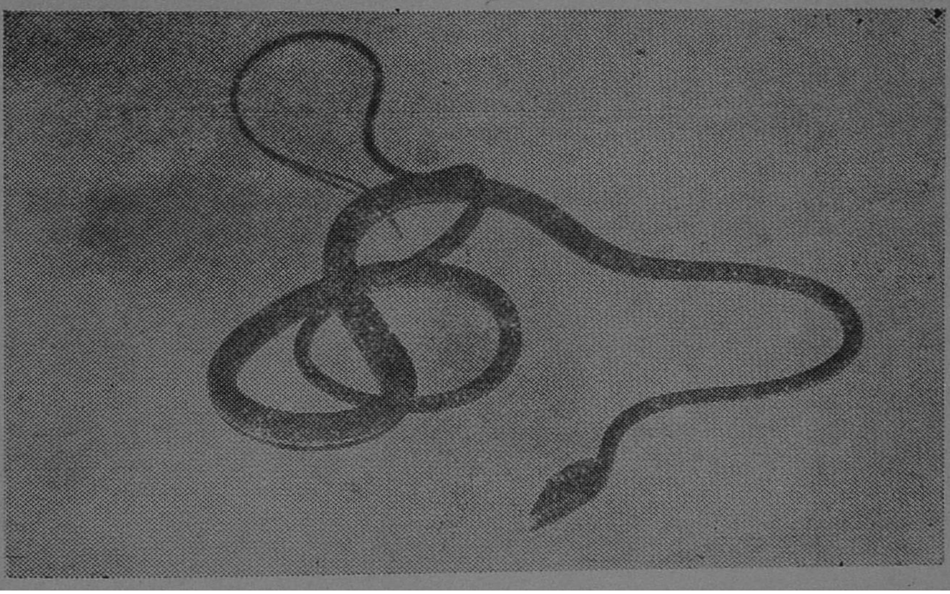


கட்டு விரியன்
The common krait



நாகப் பாம்பு (Cobra)

பச்சைப் பாம்பு (Green Snake)



markings and the triangular head and the presence of scales over the head. All vipers are viviparous, i.e., they give birth to young ones. They give birth to 20 to 40 young ones at a time. All vipers can easily be identified by the presence of scales on their heads and also by the clear demarcation between head and neck. They are distributed throughout India and they grow up to 4 feet. The second variety of viper, the **Saw scaled viper** is very small and may grow up to one foot in South India and up-to two feet in North India. There are zigzag whilte pattern design on the brownish body. They look sluggish, small and in-offensive but they cause more deaths in India, because they are widely distributed.

The scales are heeled, the edges of the heels being characteristically serrated - a feature to which the snake owes its popular name "Saw - Scaled Viper ". Rattle snakes of America are pit vipers. They are called as rattle snakes because their tail ends composed of a series of loose horny rings, which, when shaken, produce a rattling sound. Vipers are commonly called, 'Kannadi Viriyan'

Sea Snakes:-

There are 20 kinds of sea snakes in India. They are highly poisonous. But they generally do not bite. They are very sluggish. Their venom is much helpful in killing their prey,fishes. They can be easily identified by their compressed body (side to side) which is helpful in swimming. The most common are the 'hook nosed"and the 'banded' sea snakes. Sea snakes give birth to young ones except one or two species which lay eggs.

Coral Snakes:-

The coral snakes are poisonous. and they are brightly coloured. The name 'coral' is not in any way connected with original corals. Since they are brightly coloured-they

are called coral snakes. Five species of coral snakes are found in India. They grow upto 3.5 feet in length and they rarely bite. Coral Snakes live in diffrent habitat, from scrub land to Himalayas. They are nocturnal in habit and they lay eggs.

Poison apparatus :-

Poisonous snakes possess a well developed poison apparatus to secrete and inject poison into their victims. The poison glands are situated beneath the eye and these are modified salivary glands. When a snake bites, due to pressure, the poison comes out of the glands and injected into the body of the victim through their fangs. In the cobras and kraits the poison fangs are fixed, while in vipers they can be folded in the mouth when they are not in use. When the snake opens its mooth, the fangs are automatically erected.

Snake Bite :-

As mentioned earlier not all snake bites are fatal. Even the bite of a poisonous snake may not be fatal because the intensity of the bite depends upon many factors like, 1) when the snake had used its glands lastly 2) angle of the bite and 3) how poisonous is the snake. 50% of the snake bite victims die due to fear only.

There are two kinds of snake venom. One is called 'Neurotoxin' and the other is called 'Haemotoxin'. Neurotoxin type venom are found in cobras and the haemotoxin types in vipers. Neurotoxin venom affects the nervous system which leads to respiratory problems and paralytic attack. Haemotoxin attacks blood cells and the body cells, around the bite site, prevents the coagulation of blood, and causes rupture in the blood vessels.

If anyone is bitten by a snake, he should be calm till he reaches a hospital for antivenom dose. In panic if he runs here and there, it causes the blood circulation faster and the venom spreads quickly. If possible, a soft cloth may be tied around the

leg or hand (where the bite occured) just above the bite site to prevent the venom spreading faster. But the band should not be too tight to cause death to the cells, due to lack of circulation of blood.

Polyvalent Anti-Venom is effective for the bite of 4 poisonous snakes of India (i.e. Cobras, Common Krait, Russell's viper & Saw scaled viper). This antivenom is prepared in the following way. A mixture of the venom of these four is injected in to horses, gradually increasing the doses. When the horse reaches a certain level of immunity, some of its blood is drawn, blood serum is separated from blood, and freeze dried as anti-venom.

Non-Poisonous snakes:

Non poisonous snakes form a very big group. Here we shall see some of the interesting and as well as common occuring species.

Green Snakes:-

These Snakes canbe easily identified by their green colour. They are slender and grow upto 4 feet. They have a distinctive pointed, arrow shaped heads and due to the structure of its head it is called 'Eye plucking snake'. But this belief is not true. They are harmless, non-poisonous tree snakes. They climb trees and bushes at amazing speed. It is very difficult to distinguish them when they get mixed up with the surrounding vegetation. It is viviparous in nature and give birth to 6 to 8 young ones at a time. It is distributed throughout India.

Bronze back Tree Snakes :-

InTamil it is called 'Komberi Mukkan'. There is an interesting myth about this snake. It is believed that it kills a victim and climbs a tree and watches the funeral functions. This is not true. This is a harmless tree snake. Body colour is brownish black and there are two clear whitish bands merging with the ventral side

of the body. They generally occupy the plains and garden areas. They are fast climbers. They lay upto 6 eggs at a time and they are distributed throughout India.

Flying Snakes :-

Another tree dwelling species of India, is found in western ghats and in North east India. They are brightly coloured, with stripe patterns. They glide from branch to branch or from one tree to another or from tree to bushes. By rib movements they convert the undersurface of the body into concave structure and glide in the air from higher level to lower level. They are diurnal in habit and lay 6 to 12 eggs at a time. Related species are the 'cat snakes' which are not brightly coloured. They are distribiuted throughout India.

Water Snakes:-

Water snakes spend most of their time in water. Nearly 20 species of water snakes are found in India. They are called 'keel backs' because each scale has a tiny fold in it. The most common are the '**Checkered keel back**' and 'the **olive keel back'**. Both are distributed throughout India. The checkered keel back varies in colour from black to yellow with a black and white checked pattern. They bite ferociously. They lay 20 to 40 eggs at a time. The olive keel back has uniform olive green colour over its dorsal surface. They some time feed on mosquito larva.

Striped Keel backs:-

They are small snakes and distribured throughout India. In Tamil they are called 'Nikkathan Kutti'. They form the ideal specimen for the amateure herpetalogist. They grow upto 2.5 feet in length. They are distribiuted throughout India. Light black cross lines on the dorsal side with two longitudinal long strips help to identify them. They lay 10 to 12 eggs.

Rat Snakes :-

In Tamil they are called 'Sarai Pambu'. These are called

rat snakes because they mainly feed on rats. They grow upto 9 feet in length and they look like Cobras in external appearence. But they do not have the ability to form a hood. There is a belief that rat snakes and cobras mate. This is not true. Many such wrong belliefs prevail in the country. Another exam;le is the belief, that snakes take revenge. But we have a scientific explanation for this. Snakes have musk gland near the anal region. This musk is useful to detect the opposite sex during breeding season. When a snake is killed by force, the musk comes out of the gland and spread on the ground. To investigate the presence of musk, some other rat snake may come to the same spot. This developed the notion that snakes take revenge.

Snakes mate with their own species. Rat snakes eat hundreds of rats in a year and control the rat population. They are distributed throughout India and lay 10 to 15 eggs at a time.

Burrowing Snakes :

There are snakes which can burrow into the sand like earth worms. Their body is adapted to this. Their bodies are somewhat rigid and they have minute shiny scales; skull is stronger, and the eyes are very much small in size. Worm snakes, shield tails, and sand boas come under this category.

Worm snakes are so called because these look like worms. They are the smallest snakes, grows upto 4 to 7 inches in length. Fourteen species are found in India. The worm snakes are quite interesting because they are considered parthenogenic. The females can fertilize their own eggs. Worm snakes are found in moist, wet earth or under leaves.

Shield tails :-

Shield tails is another group of burrowing snakes of which 30 species are found in India. They are called as Shield tail because some of them use to close the opening of the burrow with its tail, like a shield.

Sand Boas :-

Sand boas are related to the well known boa constrictor of South America and they are also closely related to the pythons. Two species of sand boas are found in India 1)**Common Sand boa** : It is bulky snake and it grows upto 3.5 feet in length. It has a small head and narrow pointed tail. The body has blotched pattern of spots and designs. It is sometimes misidentified as Pythons or Russel's viper. There is a belief that the touch of the sand boa causes leprosy. But it is not true. 2) **Red Sand Boa** : In Tamil it is called 'Iruthalai Pambu'.. The reason is that the tail portion is blunt and it does have two black spots which look like eyes. The body is dark brown in colour. The boas are sluggish creatures and they kill their prey by squeezing it between their muscles.. Boas give birth to young ones. Anaconda of South America (a boa species) can be considered as the biggest snake in the world. It grows upto 37 feet in length.

Pythons :

In Tamil they are called 'Malai Pambu'. They are bulky snakes, grow to bigger sizes and they are generally found in forest areas with plenty of water nearby. Boas and pythons swallow their prey much larger than their own size. Their body muscles are elastic in nature, upper and lower jaw are loosely arranged and the two halves of the lower jaw are connected by elastic ligaments.

There are two species of Pythons in India. 1) **Indian Rock Python :** It is distributed throughout India. It grows upto 20 feet in length and the body has a blotched pattern. Pythons are sometimes found in estuarine mangaroove forests also. They attack and feed on small mammals and birds. They lay upto 100 eggs at a time.

2) **Reticulated Python :**

This is the biggest snake of Indian variety. It grows up to 32 feet in length. It looks like rock python but it is bigger in size. The body pattern has a reticulate design on its dorsal surface.

Pylthons are largely hunted for their skins. Now export of snake skin and snake products are banned in India. Since snakes play a major role in control of rodent population they have to be conserved.

The Madras Museum possess a fairly rich collection of snakes representing most of the South Indian species. About 62 species are represented in the entire collection and out of which nearly 50 species are represented in the galleries. The total snakes collection is about 258.

Some of the interesting specimens of the Madras Museum are

1) 16 feet skin of Python

2) 12 feet skin of King Cobra

3) 8 feet skin of Sea snake (Hydrophis species)

4) 9 feet skin of Rat snake

5) Wet preserved American Rattle snake.

Check list of Snakes in the Government Museum, Madras.

Family Typhlopidae :

Ramphotyphlops brahminus	- Sevi pambu
Typhlops acutus	- Beaked blind snake
Typhlops beddomei	

Family Uropeltidae : - *Shield Tails*

Uropeltis ocellatus	- Nilgiri sheild tail
Uropeltis ceylanicus	- Kerala shield tail
Uropeltis maculatus	- Red-Sided shield tail
Uropeltis dindigalensis	- Dindigul shield tail
Plectrurus perroteti	
Plectrurus sanguineus	
Plectrurus madurensis	

Family Collubridae :

Xenochropis piscator	- Checkered keel back
Amphiesma piscator	- Striped keel back
Amphiesma beddomei	
Cerberus rhynchops	- Dog faced water snake
Ptyas mucosus	- Rat snake
Chrysopelea ornata	- Golden Tree snake
Dendrelaphis tristis	- Common Indian Bronze back
Dendrelaphis grandoculis	
Oligodon sp.	- Kukri snakes
Oligodon venustus	
Oligodon arnensis	
Oligodon taeniolatus	
Boiga trigonata	- Common Indian Cat snake
Boiga ceylonensis	- Ceylon Cat snake
Dryocalamus nympha	- Bridal snake

Chersydrus granulatus	- Wart snake
Coluber fasiolatus	- Banded racer
Macropisthodon plumbicolour	- Green keel back
Lycodon striatus	- Wolf snake
Lycodon aulicus	
Lycodon travancoricus	
Lycodon venustus	
Dendrelaphis pictus	- Painted Bronze back tree snake
Dendrelaphis perroteti	
Ahaetulla nasutus	- Green snake
Ahaetulla dispar	
Atretium schistosum	- Olivaceous keel back
Xylophis peroteti	
Elaphe helena	- Trinklet snake
Sibynophis subpunctatus	

Family Boidae :

Eryx conicus	- Common Sand Boa
Eryx johni	- Red Sand Boa
Python molurus	- Indian Python

Family Elaphidae :

Naja naja	- Cobra
Ophiophagus hannah	- King Cobra
Bungarus caeruleus	- Common Krait
Bungarus fasciatus	- Banded Krait
Callophis bibroni	- Coral snake
Callophis melanurus	- Slender coral snake

Enhydrina schistosa	- Hook nosed Sea snake
Hydrophis spiralis	- Yellow Sea snake
Hydrophis obscurus	- Estuarine Sea snake
Pelamis platurus	- Black and Yellow Sea snake
Microcephalophis gracilis	- Narrow headed Sea snake

Family Viperidae :

Vipera russellii	- Russell's viper
Echis carinatus	- Saw scaled viper
Trimeresurus strigatus	- Horse Shoe pit viper
Trimeresurus gramineus	- Bamboo pit viper
Trimeresurus macrolepis	- Green pit viper
Trimeresurus malabaricus	- Malabar pit viper
Agkistrodon hypnale	- Hump Nosed pit viper
Crotalus ruber ruber	- Rattle Snake (Exotic Species)

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